

Adult Acute Hyperkalemia Management

Hyperkalemia is defined as an elevated potassium above the upper limit of normal. While there is no universally agreed upon potassium cut-off value to define hyperkalemia, a 2018 conference of Kidney Disease: Improving Global Outcomes (KDIGO) proposed the following:

- Mild hyperkalemia: K⁺ 5-6mmol/L **WITHOUT** ECG changes
- Moderate hyperkalemia: K⁺ 5-6mmol/L **WITH** ECG changes or K⁺ 6.1-6.5 **WITHOUT** ECG changes
- Severe hyperkalemia: any K⁺ >6.5 or K⁺ 6.1-6.5 **WITH** ECG changes

Acute hyperkalemia typically develops as a result of increased intake, decreased excretion, or a shift from the intracellular to the extracellular space. While many with hyperkalemia are asymptomatic, patients may present with muscle weakness, paresthesias, and potentially lethal cardiac conduction abnormalities or arrhythmias.

Treatment options for acute hyperkalemia are included in the algorithm in appendix A and may include:

- IV calcium
 - used to stabilize the cardiac cell membrane, preventing ventricular fibrillation/tachycardia; does not lower potassium level
 - should be given immediately in patients with ECG changes
 - calcium gluconate given slow IV push over 5 minutes is preferred due to lower risk of tissue damage, but calcium chloride may be given slow IV push if central line is present. Do not delay treatment to obtain central access.
- IV insulin + dextrose
 - Used to shift potassium intracellularly
 - Usual dose is 10 units, but may give 5 units in patients at high risk for hypoglycemia (elderly, low body weight, renal impairment)
 - Dextrose 50% 25gm/50mL (one “amp”) should be given BEFORE insulin as a safety measure in case the administration of the second medication is delayed
 - Frequent blood glucose checks are required for the duration of the regular insulin effect (4-6 hours)
 - Flush line with 10mL 0.9% NaCl after administration of insulin
 - IV insulin should **always** be prepared and administered using an insulin-specific luer lock syringe
- High dose albuterol via nebulization
 - May be used with or in place of insulin and dextrose to shift potassium intracellularly
- Sodium bicarbonate
 - Activates the Na⁺-K⁺-pump and corrects metabolic acidosis
 - Evidence of effectiveness in lowering potassium is conflicting
 - Consider in patients with metabolic acidosis without volume overload
- Furosemide
 - Used to eliminate potassium from the body through the urine
 - Most useful in patients with hyperkalemia and volume overload/heart failure or after fluid resuscitation
- Lokelma (sodium zirconium cyclosilicate) or Kayexalate (sodium polystyrene sulfonate)
 - Bind potassium in the GI tract and eliminate from the body
 - Due to risk of serious GI adverse effects with Kayexalate, Lokelma may be preferred

Approved by:

References:

1. Linder, Burdemann, et al. (2020) Acute Hyperkalemia in the Emergency Department: a Summary from the Kidney Disease: Improving Global Outcomes Conference. *European Journal of Emergency Medicine*. 27(5) 329-337.
2. Moussavi, K., Fitter, S., Gabrielson, S., Koyfman, A., & Long, B. (2019) Management of hyperkalemia with insulin and glucose: pearls for the emergency clinician. *The Journal of Emergency Medicine* 57(1) 36-42.
3. Paparella, S. (2018) Avoid Insulin-Related Adverse Events when Treating Hyperkalemia. *Journal of Emergency Nursing*. 44(4) 413-415.

Appendix A: Severe Hyperkalemia Management Algorithm

